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ABSTRACT

Checklists and other materials to be used in planning and implementing computer literacy and computer skills programs in a kindergarten-to-eighth grade school system are presented in this packet, originally irtended to supplement oral presentations. The materials were developed in California's Fallbrook Union Elementary School District in the course of the district's own planning and implementation process. The materials presented include a diagram of the structure of Fallbrook Union's computer literacy program and checklists of questions to be considered by planners concerning the superintendent's role, the board of education's role, the financial resources available, inservice training for teachers, evaluation of hardware and software, facility requirements, the role of a computer student planning committee, and program evaluation. Other materials include tables comparing the relative advantages of locating computers in classrooms or in special computer labs; a list of funding sources (particularly relevant to California); a curricular plan outlining the information and skills to be taught to students, the specific competencies students are to demonstrate, and the grade level at which the curricular elements are to be introduced, expanded upon, and reinforced; and a brief description of a computer inservice plan. (PGD)

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Designing and Implementing a Quality Computer Program

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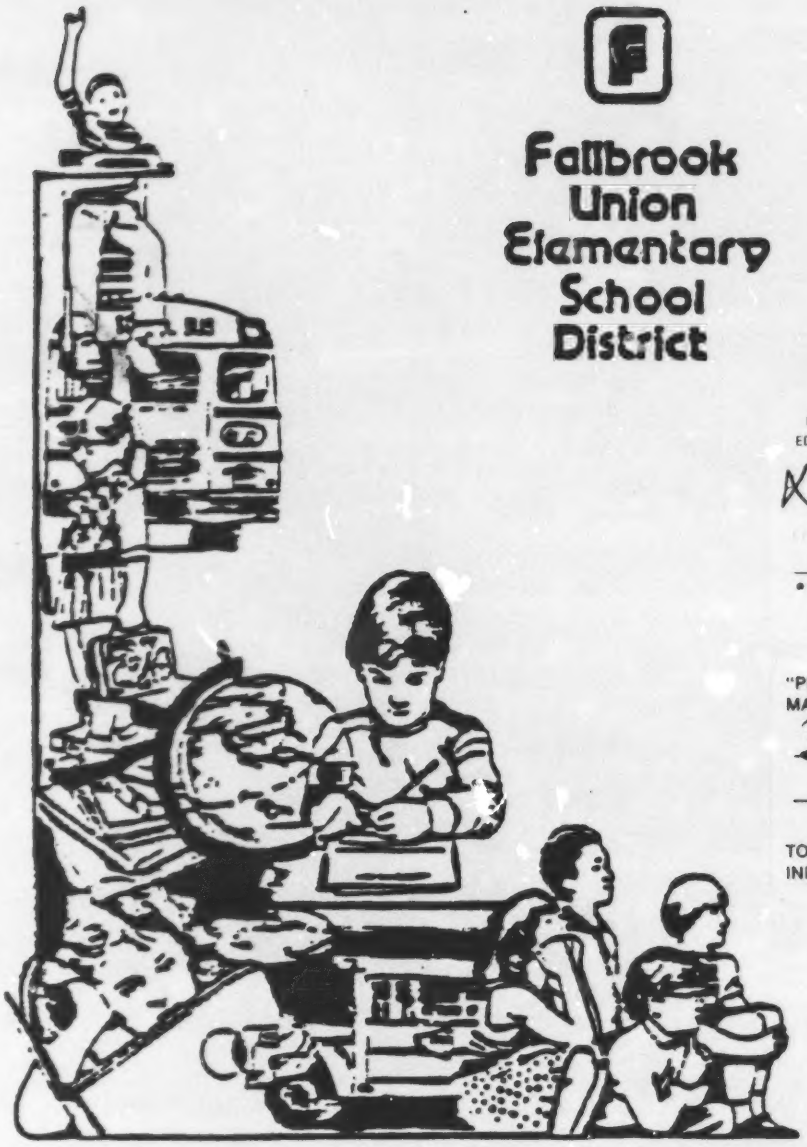

Fallbrook Union Elementary School District

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CALIFORNIA EDUCATIONAL INITIATIVES FUND

FALLBROOK UNION ELEMENTARY SCHOOL DISTRICT

THE FALLBROOK ELEMENTARY DISTRICT EXPERIENCE

Designing and Implementing a Quality Computer Education Program

The presentation will address two key major topics in relation to the process and method of aligning a district's curriculum to the computer age. The first presentation will be an overview of the process a school district should go through to initiate a quality computer program from an experienced site administrator who developed a comprehensive computer program. The second presentor's topic defines the elements as well as "how to" begin and execute the alignment process. This workshop answers concerns of school districts from an experienced administrator in computer and instructional alignment.

The Fallbrook Union Elementary School District, under the leadership of Dr. William E. Diedrich, Superintendent, has become a model district in computer education. The district has computer labs at all schools. The training program curriculum and Potter Junior High lab have been said to be "the best in California" by an Apple corporate executive, major software author and the San Diego County Office of Education. The workshop presentor, Bob Ferguson, has been involved from the beginning in the development of computer education in Fallbrook.

The presentation will give examples of the application of current technology. Participants will receive a complete overview of the process and methods necessary to align classroom instruction, curriculum and state frameworks using the micro-computer as a component. Each participant will receive a sample package of practical information that can be applied the next day in their school district.

The seminar is planned to respond to school and district concerns from experienced personnel. The advice will be practical, easily understood and presented from a non-technical point of view.

The Fallbrook District has 15 computers in the four K-6 schools, 21 in the K-8 school, and the junior high school has over 90 Apples in three separate computer labs plus five in an ESL classroom. Eighty percent of the junior high instructional staff have over 45 hours of computer instruction. In addition to Computer Science and Word Processing classes, the labs are used by other departments in "pull-out" programs where entire classes are brought into the labs.

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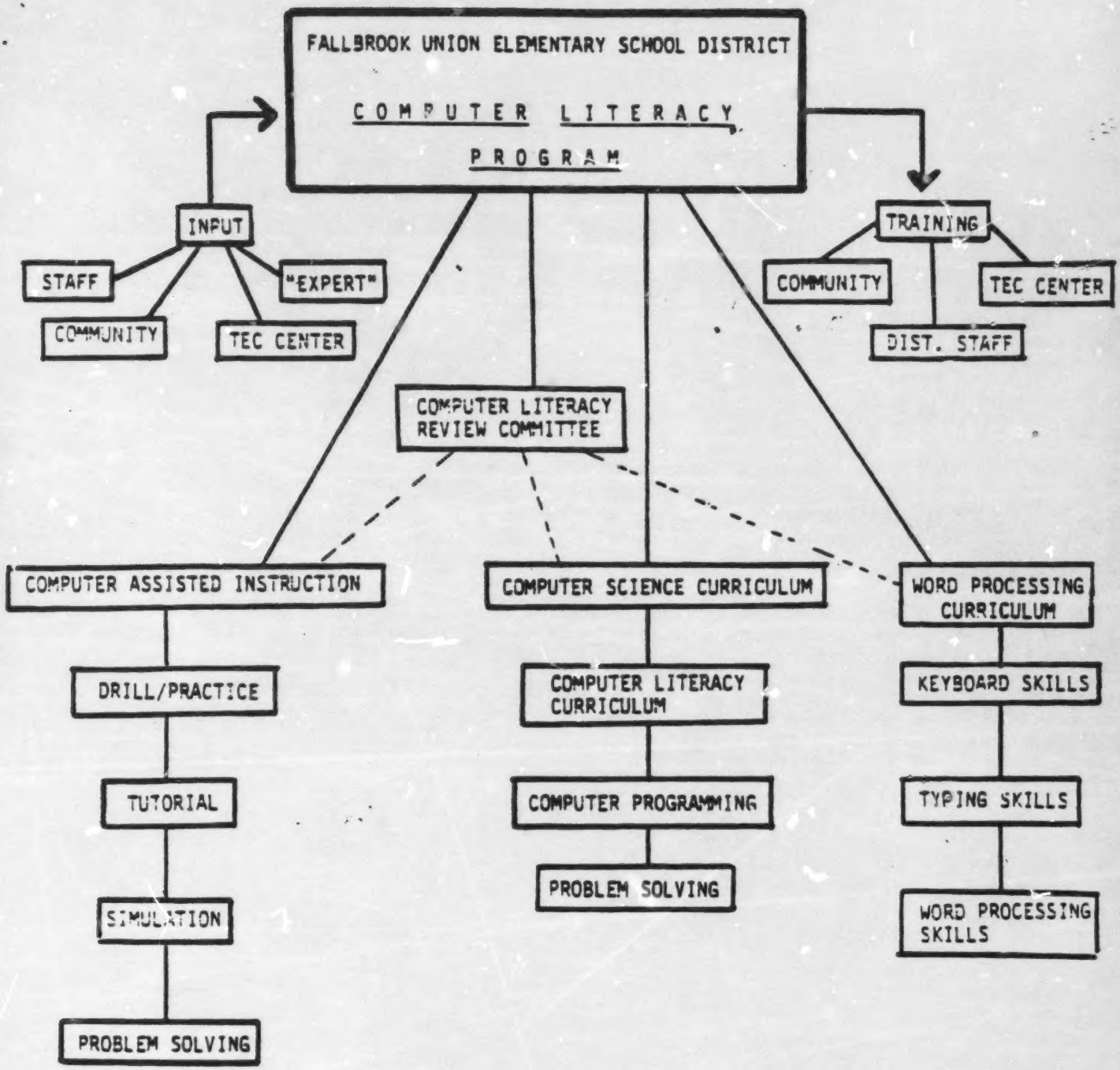

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"HOW TO AVOID SYNTAX ERRORS IN PLANNING"

I. SUPERINTENDENT'S COMMITMENT:

A. What is the "Level of Computer Awareness" of the District Superintendent?"

B. What would the Superintendent like to see as an "end product" for the District program?

C. Is he/she willing to learn about Computer Literacy?

D. Will the Superintendent attend conferences on Computer Education?

E. Will the Superintendent back a District "thrust" for Computer Literacy?

F. Will he/she help increase the Computer Education of the Board of Trustees/ Education?

G. Will the Superintendent support the use of District funds to establish a Computer Literacy program?

H. What is the Superintendent's philosophical background on the teacher/computer "partnership"?

I. BOARD OF TRUSTEES/EDUCATION COMMITMENT:

A. Can the Board agree on the need for a Computer Literacy program?

B. Do you have 5/7 "resident experts" on Computers? Can they reach a common level of Computer Education?

C. Are Board members willing to be "inserviced" on Computer Education?

D. Are Board members willing to attend conferences?

E. Are Board members willing to let the District staff and the Superintendent develop a computer program?

F. Are Board members willing to spend General Fund Dollars. Are you restricted to categorical/special funding?

G. What is the Board's commitment toward a District Computer program?

H. Is the Board in agreement, philosophically, on the teacher/computer "partnership"?

I. What are the communities expectations and commitments toward a quality Computer program (see Section IX)?

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J. Before the Board is asked to make a decision, make sure that they know what they are approving, have been given the necessary background information, and know "desired learner outcomes".

NOTE: It is imperative that the Board be kept informed of District progress toward the establishment of a Computer Literacy program throughout periodic Board "updates".

III. FINANCIAL RESOURCES:

A. Grant writing (i.e., AB551 and Chapter I) is critical! It is not only "what" you write, but "how" you write it. Your grant is in competition with other grants!

B. Don't overlook local businesses/service club contributions. One school district received over $25,000 in contributions of $500 or less.

C. Can you enlist support for PTA/Community contributions? It can be a school project.

D. Joint purchases are possible:

1. City/School District
2. School District/School District
3. School District/Adult School
4. State Buy (i.e., Apple //e in California)

E. School fund raising activities (ASB) can be utilized to buy software/hardware.

F. "Creative Financing" by districts. A district can recoup some monies by charging for computer classes/rental of computers.

G. SB 201 (Builder's fees) can build and equip with education supplies (i.e., computers?)

IV. STAFF INSERVICE TRAINING:

A. You will need to determine the teacher's attitudes toward computers.

B. Do you want to provide inservice during school hours/after school hours? Is staff to be paid?

C. Do you want to provide inservice during school year/summer vacation? Is staff to be paid?

D. What is the goal of your inservice training?

1. Computer Literacy (level desired)
2. Software Evaluation
3. Minimal Programming (level desired)
4. Curriculum Development
5. Programming Skills

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D. Will you use outside/inside teachers or vendors, TEC Centers, vendors, college and universities? Choose your inservice teachers carefully. Knowledge of computers may not guaranty good teachers.

E. How can you fund for release time of staff? Do you have the necessary funds or can you cover internally?

F. Will it be mandatory for all staff to participate in the inservice? Do you want to recruit or ask for volunteers?

G. What timing variables do you want to use for inservice training?

1. Consecutive vs. spaced. Five days at 8 hours a day or every Tuesday from 3-6 p.m.

H. Will your district grant credit on teacher salary schedule - similar to college credits?

I. What will the instructor's pay be for qualified teachers? How much can you afford?

J. What is the amount of time required for inservice - 10 hours, 45 hours, etc? Do you want all staff to have a minimum inservice requirement?

K. Who is your inservice designed for: teachers, staff, administrators, Board members, parents/community? Do you want to group heterogeneously or homogeneously?

L. How are you going to evaluate the effectiveness of inservice programs? (See Section XI)

M. Do you want to develop a support system for pre-inservice and follow-up inservice?

V. <u>SOFTWARE EVALUATION</u>:

A. The district needs to develop/select a common software evaluation form to be used by teachers.

B. Can the software be previewed? Is there a charge or is it applied to the purchase price?

C. Before purchasing software, review other software evaluations (publications, TEC Center, MECC, and San Mateo Clearing House).

D. Does software meet the goals and objectives of district curriculum?

E. Does software provide documentation? Is it "user friendly" and complete?

F. How many copies of the software do you need? (Mutliple use vs. copyright laws).

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G. What is the instructional quality and technical quality of the software package?

H. Is the software to be used only on disk drive or can it be networked? Can it be loaded on a hard disk drive?

I. Is the software "user friendly" for the students? At what level is the software going to be used?

J. Is a printer required? Is a modem required? What type monitor does the software require - green screen or color?

K. Is the software to be used on DOS or CPM micros?

L. If your lab is CAI (Computer Assisted Instruction) based, the success of the program is based on quality software.

M. For most districts, the type of available hardware will greatly influence the type of computer.

VI. HARDWARE EVALUATION:

A. Do you have a local vendor? Will they provide inservice/on site service?

B. Is the hardware time tested and validated?

C. Does hardware allow for expansion? What are your expansion needs for peripheral expansion?

D. What is the turn around time for repairs from dealer? Can you get a written guarantee from the dealers?

E. Is there good and well documented software compatable with this hardware?

F. How does the microcomputer store programs (cassette, disks, etc.)? Is there a need to be consistent throughout the district?

G. What memory capacity do you need? (More is not always better and 64K should satisfy most school needs.)

H. Does the district want to standardize an operating system (Disk Operated System - DOS, Control Program Micro - CPM)? Is there a need to be consistent throughout the district?

I. What visual display (green screen or color) on the monitor do you need? Note: green screen is preferred for word processing.

J. What are the computer languages to be used (BASIC, LOGO, etc)? Do you want to expand languages in the future?

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K. Determine the keyboard users - elementary students, secondary students, adults. Some computer keyboards are easier for elementary students.

L. You need to consider the keyboard's ease of use - control keys, "Help" keys, etc.

M. Are the service and maintenance contracts with the vendor and manufacturer?

N. Do you want to standardize all district computers? (single service contract, single software purchase, possible lower bid purchase, single training course, less confusion for learner, etc.)

VII. PERIPHERAL (AUXILIARY) EQUIPMENT NEEDED:

A. What are your disk drive needs? (single density? Tape drive, disk drive, hard disk drives?)

B. What are your printer needs (daisy wheel, dot matrix?) Note: a 10 minute tape program will load on a floppy disk in less than 10 seconds and the floppy disk is more durable than a tape.

C. Will your computer program need scanners (reads typed copy into the computer)?

D. Will your district want phone modems to tie into other computers?

E. Do you need light pens/graphics table (i.e., koala pad)?

F. Do you need speakers/voice synthesizers (Echo II)?

G. Do you need networking hardware (corvus capability type)?

H. What are your furniture needs for hardware - be careful you don't sacrifice price for safety.

I. Do you want a graphic plotter to create graphs/pictures?

VIII. COMPUTER CENTER - PHYSICAL:

A. Determine the security needs of computer center! (Spend money to save money.)

B. Determine your power supply needs/number of circuits and outlets needed. Is a power surge protector needed?

C. Networking needs - do you want a separate circuit for Corvus? Do you want a backup for protection?

D. Do you want a master On/Off system for all computers?

E. Keep chalk boards (dust) away from the computers.

F. Try to minimize screen glare. What are the lighting needs for students during the day/night?

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G. Keep paper and pencil area separate from computer use area.

H. Adequate storage of software (locked cabinets) is needed - responsibility for check out?

I. Do you need to build a library area - do you need student use of reference materials?

J. Do you want to incorporate and build in large group instruction and small group instruction areas within the computer lab?

K. Determine the space requirements between computers. Determine if you are going to use one or two students for each computer.

L. Determine the height of computer stands - what is the height of the students?

M. Mobile carts vs. computer lab - determine pros and cons by site.

N. Do you need a telephone line installed (modems)—location of phone lines?

IX. COMPUTER STUDY PLANNING COMMITTEE:

A. What is the size of the committee (15-20)? What do you consider manageable?

B. What are the possible components of the committee?

1. District Administration
2. School Site Administrator
3. Department/Grade Level Teachers
4. Special Projects/GATE/Special Ed.
5. Parents
6. Board Members
7. Industry/Business
8. Computer Users in Community
9. Students
10. Computer science "experts" in area

C. What are the goals and objectives (is the planning committee included in policy making)? What is the "charge" of the committee?

D. Set sub-committee assignments - topics for sub-committee to be predetermined or let committee decide.

E. Determine the time line for committee - does each sub-committee have a separate time line?

F. Do you want to do a needs survey of schools? What do they want the outcomes of this committee to be?

G. How will you utilize the computers in the district?

1. Computer literacy
2. Computer Assisted Instruction (CAI)
3. Computer Managed Instruction (CMI)
4. Occupational/vocational
5. Word processing
6. Media Center
7. Counseling - guidance
8. Administration/office

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H. Determine the security/insurance needs of the district. Do you need to update insurance coverage?

I. How will you upgrade the equipment and replace the equipment as the "state of the art" changes.

J. How much computer time per student does the district want? This will influence the amount of hardware.

X. SCOPE AND SEQUENCE:

A. Do you want to form a task force - part of the computer study committee?

B. Do you need to coordinate a base program and instruction for hardware, software and peripherals?

C. Do you need to state developmental levels and computer education objectives (student learner outcomes)?

D. Do you want to plan curriculum implementation with hardware and software acquisitions?

E. You will need to articulate curriculum with staff development. The established goals and objectives must be correlated with all curriculum by grade level. The resulting curriculum change may result in additional staff development needs.

XI. EVALUATION PROCESS:

A. Evaluation Design:

1. Does your district need to conduct a needs assessment survey? (Optimal minus contractual equals needs).

2. Have you developed and evaluation design and questions?

3. Have you developed three year objectives?

4. Have you acquired and or developed measurements?

5. Have you articulated and prioritized activities to your objectives?

6. Have you implemented your program?

7. Have you prepared a written evaluation report?

8. Have you made an oral presentation on written reports to all pertinent committees or agencies?

B. Developing a summative and formative procedure:

1. Formative

a. have you allowed for flexibility?

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b. have you consistently reviewed your "game plan'?

c. have you stayed within your time line?

d. did you keep anecdotal notes?

e. did you allow for inservice time to interact with staff, parents and community members?

f. have you been sensitive to additional benefits?

2. Summative

a. have you evaluated by objectives?

b. have you evaluated the effectiveness of your implementation efforts?

c. did you survey staff and students?

d. have you indicated the effectiveness of your program on student achievement and/or behavior?

e. did you make summary statements addressing the impact of your program on the improvement of your instructional skills and practices?

f. have you sequenced your data by objectives?

g. did you review your evaluation questions and objectives monthly? are you on target?

h. have you prioritized your objectives and activities monthly, yearly and long-range?

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CHECKLIST FOR SELECTING HARDWARE

1. How does it get along with students?
2. How far will it let your students grow?
3. How much educational software is available?
4. How many ways can the computer earn its keep?
5. Can it paint rainbows and surround them with music?
6. Does it speak your language?
7. Is the system rugged and reliable?
8. Can it be connected to other computers in the classroom?
9. What support will you get from the manufacturer and the dealer?
10. What are the financial options?
11. What computers are your employees trained to use?
12. What are you: training support systems equipped to teach?

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Important Considerations for Selecting Instructional Software

- ☐ Can the software be previewed in advance of purchase?

  --Santa Clara County Office of Education

- ☐ Do the programs follow good educational practices?

  --Not all programmers are educators!
  --Some graphics are distracting to learners.

- ☐ Does the software take full advantage of the computer?

  --Why use a crane to lift an object weighing 2 lbs.?

- ☐ Are we purchasing a series of different programs from this company or merely the same program with minor variations of data.

  --Some courseware is repetitious.

- ☐ Does the program hold the learners' attention?

  --Is the same tune or graphic display repeated time after time?

- ☐ Are incorrect responses reinforced more strongly than correct ones?

  --Some programs use fascinating graphics for wrong answers which intrigue pupils more than correct choice displays.

- ☐ Is the program "user-proofed" against incorrect erasure, etc.?

- ☐ Can potentially distracting sound effects be turned down or eliminated?

  --Remember those classroom noise levels!

- ☐ Are written instructions appropriate for various grade levels?

- ☐ Are the user-response procedures as simple as possible?

- ☐ Is the program paced according to learner ability levels?

- ☐ With math programs, does the sequence of computation match what the student has learned in texts and on the board?

  --Watch those columns!

- ☐ Are response procedures consistent with other programs?

  --Are the same keys used for some responses?

- ☐ How well will the software interface with other equipment?

- ☐ Are the programs "user-friendly", that is, do instructions and procedures reflect a personal interest in the learner?

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SOFTWARE EVALUATION

PLEASE COMPLETE AN EVALUATION FORM FOR EACH DISC YOU REVIEW

TITLE OF DISC* _____

1. TYPE:
   - ☐ COMMERCIAL ☐ PUBLIC DOMAIN

2. SOURCE: _____
   _____
   PHONE: _____

3. SUBJECT:
   - ☐ MATH ☐ L. ARTS ☐ SCIENCE
   - ☐ READING ☐ SOCIAL STUDIES
   - ☐ OTHER _____

4. GRADE LEVEL:
   - ☐ K-3 ☐ 4-6 ☐ 7-8 ☐ HS

5. DOCUMENTATION:
   DOES IT HAVE AN ACCOMPANYING "TEACHERS GUIDE" WHICH EXPLAINS OR INCLUDES:
   - ☐ SUBJECT AREA
   - ☐ GRADE LEVEL
   - ☐ CLASSROOM USE IDEAS
   - ☐ SAMPLES/EXAMPLES
   - ☐ LOADING INSTRUCTIONS
   - ☐ OTHER _____
   _____

6. BACKUP COPIES:
   - ☐ UNLIMITED COPIES OKAY, NO COST
   - ☐ ADDITIONAL COSTS INVOLVED FOR ADDITIONAL COPIES (EXPLAIN):
   _____
   _____

7. PROGRAM ITSELF:
   - (A) ARE DIRECTIONS CLEAR, UNDERSTANDABLE? _____
   - (B) PUNCTUATION ACCURATE, ACCEPTABLE?
   _____
   - (C) OTHER FEATURES: _____
   _____
   - (D) COST: _____
   - (E) YOUR RATING:
     - ☐ OUTSTANDING ☐ SUPERIOR
     - ☐ GOOD ☐ OKAY ☐ FORGET IT
   - (F) COMMENTS: _____
   _____
   _____

8. EVALUATOR:
   NAME: _____
   SCHOOL/DEPT: _____
   GRADE(S): _____
   DATE: _____

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HOW THE LOCATION OF SCHOOL MICROS AFFECTS THEIR USE

	CLASSROOM ONLY		COMPUTER LAB	
	ELEMENTARY	SECONDARY	ELEMENTARY	SECONDARY
More Teachers Use Micros Regularly	X	X	*	*
More Students Use Micros Regularly	O	O	*	O
Students Have More Computer Time	O	X	*	*
The Computer Is Used Across The Curriculum	X	O	O	*
Programming is Emphasized Over CAI	X	X	*	*
Computer Use is Divided Evenly Between Above-and Below-Average Students	O	*	X	X

X = is less likely to happen in this arrangement

O = is not affected by this arrangement

* = is more likely to happen in this arrangement

COMPUTER vs. CLASSROOM EDUCATION

ADVANTAGES

CLASSROOM

1. Easier classroom student access
2. Less expense in staffing and possible "lab" building expense
3. Teacher can control curriculum in classroom easier

COMPUTER LAB

1. One "expert" in charge of facilitating curriculum
2. Centralized secure room
3. Easily "networked"
4. Group teaching easier
5. Insure "common" teaching experience
6. Can use "pull-out" or group work easier

DISADVANTAGES

CLASSROOM

1. All teachers must have similar level of training
2. Doesn't give the guarantee that all students will receive equal instruction
3. Security problem with computers in different locations
4. All teachers may not see the computer as "positive" and withhold instruction

COMPUTER LAB

1. Space problem of where to put a lab
2. Possible expense in the staffing for computer lab
3. Dependent on one person (if sick?)

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COMPUTER EDUCATION FUNDING

(Possible Sources)

GRANT NAME	STATE/FEDERAL	MONEY TO BE USED FOR
1. SB 201 (Builders Fee)	State (CAL)	New buildings/interior supplies
2. AB 803	State (Calif)	Computers
3. AB 551	State (Calif)	Training for Computer Education
4. Chapter II	State (Calif)	Computer Education
5. Title VII	Federal	Bilingual Computer Education
6. Chapter One	State (Calif)	Below 26% Percentile on CTBS
7. Migrant Education	State (Calif)	Computer Education for Migrant Students
8. Bank of America	Private	Hardware/Software
9. Consolidated Funds	State (Calif)	SIP Fund, ECIA
10. Standard Oil (Chevron)	Private	Hardware/Software

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COMPUTER AND CALCULATOR EDUCATION

CONTENTS

Computer Awareness

1. The student will recognize the make-up of a computer.
2. The student will be able to describe how computers affect our lives.
3. The student will be able to trace the history of computers.
4. The student will understand the moral issues involved with computer use.

Student Interaction Skills

5. The student will develop keyboard skills.
6. The student will demonstrate general uses of the computer.
7. The student will demonstrate specific uses of the computer.

Student Programming

8. The student will demonstrate skill at flow charting.
9. The student will demonstrate knowledge of computer language.
10. The student will produce computer graphics.
11. The student will develop programming skills.

Calculator Component

12. The student will become proficient in the use of calculators.

Introduce = I Expand = E Reinforce = R

COMPUTER AWARENESS

		K	1	2	3	4	5	6	7	8
1.	The student will recognize the makeup of a computer.									
101	The student will become familiar with computers by observation.	I	E	R	R	R	R	R	R	R
102	The student will be able to describe in his/her own words what a computer is.	I	E	E	R	R	R	R	R	R
103	The student will develop a positive attitude toward computers.	I	E	E	E	R	R	R	R	R
104	The student will identify the basic part of a computer (i.e., keyboard, screen or monitor, disc drive, on/off switch).	I	E	E	E	R	R	R	R	R
105	The student will be able to define and use the following general computer terminology: RAM, ROM, CPU, CRT, K, BASIC				I	E	E	E	R	R
	Programs, programmer, programming, memory, main frame, line printer, graphics and cursor					I	E	E	R	R
	CAI, CMI								I	E
106	The student will be able to define and distinguish between computer software and hardware.			I	E	E	R	R	R	R
107	The student will be able to recognize the capabilities of different computer types (sizes, brands and special purpose machines).				I	E	E	E	R	R
108	The student will be able to explain how a computer works.		I	E	E	R	R	R	R	R

Introduce = I Expand = E Reinforce = R

COMPUTER AWARENESS	K	1	2	3	4	5	6	7	8
2. The student will be able to describe how computers affect our lives.									
201 The student will be able to list accuracy, speed and memory as positive characteristics of a computer.				I	E	E	R	R	R
202 The student will explain ways computers affect people's lives.			I	E	E	E	R	R	R
203 The student will identify computer related occupations.			I	E	E	E	R	R	R
204 The student will list values of computer skills for future employment.							I	E	E
205 The student will explain the statement "Computer mistakes are mistakes by people".							I	E	E
206 The student will identify various functions which are not suited for computers.					I	E	E	R	R
207 The student will hypothesize about the limitations of computers.							I	E	E
208 The student will be able to list advantages and disadvantages of a computer.					I	E	E	R	R

Introduce = I Expand = E Reinforce = R

COMPUTER AWARENESS

	K	1	2	3	4	5	6	7
3. The student will be able to trace the history of computers.								
301 The student will be able to trace the history of computers from the abacus in 450 B.C. to the present day microcomputers.					I	E	E	E
302 The student will become aware of 4 generations of computers: vacuum tubes, transistors, integrated circuits, microprocessing (CHIPS).							I	E
303 The student will be able to identify major computer companies and centers in Southern California.							I	E
4. The student will understand the moral issues involved with computer use.								
401 The student will be able to explain in his own words the implications of copyright laws.						I	E	E
402 The student will identify advantages and dangers of computer data bases.							I	E
403 The student will describe the serious legal issues resulting from widespread computer use.							I	E
404 The student will identify and read computer-related books, magazines, etc.							I	E

Introduce = I Expand = E Reinforce = R

STUDENT INTERACTION SKILLS	K	1	2	3	4	5	6	7	8
5. The student will develop keyboard skills.									
501 The student will identify and use letters and numbers on the computer keyboard.	I	E	E	E	R	R	R	R	R
502 The student will identify and use common special purpose keys. (Return, space bar, ←, →, #, Shift, Control, Esc, Reset, :, ;, ", *, ', +, -, > , <).		I	E	E	R	R	R	R	R
503 The student will develop correct keyboarding skills. (typing)				I	E	E	E	E	R
6. The student will demonstrate general uses of the computer.									
601 The student will demonstrate proper care of software/hardware.	I	E	E	R	R	R	R	R	R
602 The student will demonstrate ability to stop, escape from and continue a program as needed.				I	E	E	R	R	R
603 The student will demonstrate how to load a preprogrammed disc, (insert the disc, turn on the computer, and boot a program.-			I	E	R	R	R	R	R
604 The student will run a program from the catalog or a menu.			I	E	E	R	R	R	R
605 The student will recognize error messages: simple messages (e.g., syntax error, break in, file type mismatch, file not found, IO error, out of data).			1	E	E	R	R	R	R

Introduce = I Expand = E Reinforce = R

STUDENT INTERACTION SKILLS	K	1	2	3	4	5	6	7	8
7. The student will demonstrate specific uses of the computer.									
701 The student will successfully complete a drill and practice program.			I	E	E	R	R	R	R
702 The student will participate in a simulation program in a content area.				I	E	E	R	R	R
703 The student will use and interact with prepared tutorial for basic instruction in a given curriculum area.				I	E	E	R	R	R
704 The student will be able to distinguish between drill and practice simulation and tutorial programs.					I	E	E	R	R
705 The student will use a computer as a word processor.						I	E	E	E
706 The student will use a data base program.								I	E
8. The student will demonstrate skill at flow charting.									
801 The student will participate in logic and sequencing activities.		I	E	E	E	E	R	R	R
802 The student will draw a flow chart to demonstrate the solution of a given problem.						I	E	E	E
803 The student will write a flow chart for a program and convert it to BASIC.							I	E	E

Introduce = I Expand = E Reinforce = R

STUDENT PROGRAMMING

	K	1	2	3	4	5	6	7	8
9. The student will demonstrate knowledge of computer languages.									
901 The student will discuss the reasons for various versions of BASIC.							I	E	E
902 The student will be aware of reasons for the widespread use of BASIC in educational and personal computing.						I	E	E	E
903 The student will identify names of other major computer languages and their uses (COBOL, FORTRAN, PASCAL).					I	E	E	E	E
904 The student will list some LOGO commands.					I	E	E	E	E
905 The student will distinguish similarities and differences in BASIC and LOGO commands.								I	E
10. The student will produce computer graphics.									
1001 The student will explain how computer graphics are used in engineering, science, art, etc.					I	E	E	E	E
1002 The student will create graphics design in low-resolution color graphics.					I	E	E	E	E
1003 The student will create program using turtle graphics.					I	E	E	E	E
1004 The student will utilize sound and color in a computer program.							I	E	E
1005 The student will create a graphic design program that has movement.								I	E

Introduce = I Expand = E Reinforce = R

STUDENT PROGRAMMING	K	1	2	3	4	5	6	7	8
11. The student will develop programming skills.									
1101 The student will list some programming commands.					I	E	E	E	E
1102 The student will edit a simple program for spelling, punctuation and/or syntax errors.						I	E	E	E
1103 The student will write procedures with single and multiple inputs.						I	E	E	E
1104 The student will write simple programs in Applesoft, Super Pilot and Pilot.						I	E	E	E
1105 The student will write simple text programs (e.g., quizzes, dialogs, cenquains).						I	E	E	E
1106 The student will use music in a program.							I	E	E
1107 The student will input to the computer a given program.						I	E	E	E
1108 The student will use the immediate and deferred modes to write mathematical problems on the computer.							I	E	E
1109 The student will modify an existing program.								I	E

Introduce = I Expand = E Reinforce = R

STUDENT PROGRAMMING	K	1	2	3	4	5	6	7	8
1110 The student will distinguish DOS commpands from program statements.							I	E	E
1111 The student will write a BASIC program using string data.								I	E
1112 The student will explain looping and its advantages in computer programming.								I	E
1113 The student will utilize one dimensional arrays in computer programming.								I	E
1114 The student will write a BASIC program utilizing a two-dimensional array.								I	E
1115 The student will build a file to be accessed by a BASIC program.								I	E
1116 The student will write a multiple-choice response activity in BASIC and/or Pilot.								I	E
12. The student will become proficient in the use of calculators.									
1201 The student will develop an awareness of calculator usage in our present technology.	I	E	E	E	R	R	R	R	R
1202 The student will explore the use of motivation and enrichment activities.	I	E	E	E	E	R	R	R	R

Introduce = I Expand = E Reinforce = R

CALCULATOR COMPONENT	K	1	2	3	4	5	6	7	8
1203 The student will explore the relationships of number and order through counting and number recognition.	I	E	E	E	R	R	R	R	R
1204 The student will explore the use of calculators for recreational activities.	I	E	E	E	R	R	R	R	R
1205 The student will explore and analyze number patterns.	I	E	E	E	R	R	R	R	R
1206 The student will explore the mechanics of the calculator and its function and logic.		I	E	E	R	R	R	R	R
1207 The student will develop skills to solve problems involving +, -, and $\div$ of whole numbers.			I	E	E	R	R	R	R
1208 The student will develop the skill necessary to estimate quantified data.			I	E	E	E	R	R	R
1209 The student will develop the skill to solve word problems involving one-step solutions.			I	E	E	R	R	R	R
1210 The student will develop the skill to solve problems involving +, -, x, of decimals.					I	E	E	R	R
1211 The student will develop the skill of using a calculator to change fractions to decimals to percents, and vise-versa.					I	E	E	R	R
1212 The student will develop the skill of using a calculator to solve word problems involving a multiple step solution.					I	E	E	R	R
1213 The student will develop skill in using special function keys (memory, constant, $\sqrt{\ }$, sin, cos, etc.) to solve problems.							I	E	E

COMPUTER INSERVICE PLAN

GOAL:

To train 100% of the instructional staff in: COMPUTER AWARENESS (history, care and general use, keyboard, moral issues and societal implications); SPECIFIC USES (using the computer for individualizing instruction i.e. CAI [Computer Assisted Instruction] and CMI [Computer Managed Instruction]), INTERACTIVE SKILLS (word processing, data management,etc.), COMPUTER LITERACY (languages, programming), and INFORMATION RETRIEVAL (accessing information data bases).

METHOD:

Each school will be given a training allocation for the next three years. The option will be left to the school staff and principal to sequence, schedule and prioritize the training. For example, one school might opt to begin with computer literacy while another might choose to begin with awareness, specific uses or two or three of the areas. The goal is for all staff members to complete the whole sequence based on the needs of the staff, students and previous experiences.

The Central Office staff would assist the schools in securing trainers, purchasing training materials and scheduling community classes in the evenings. Staff would have the option of participating in the district community training, school programs or both. At some schools, principals may find that some staff have already mastered all of the objectives. For proficient staff members, county programs and state conferences would be appropriate.

Each principal should use the District Computer Training Needs Assessment to prioritize training. Each school would determine where to begin training and complete training in all of the areas (COMPUTER AWARENESS, INTERACTIVE SKILLS, INFORMATION RETRIEVAL and SPECIFIC USES) until all of the staff members were knowledgable users at a proficiency level that is appropriate for their teaching assignment and to implement the District Computer Curriculum.

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